

CLAIMS

I claim:

1. A process for converting a hydrocarbon feedstock using a catalyst, said process comprising:
 - (a) contacting the hydrocarbon feedstock with a first molecular sieve and then a second molecular sieve to produce a treated hydrocarbon feedstock, said second molecular sieve being different from the first; and
 - (b) contacting the treated hydrocarbon feedstock with the catalyst under conversion conditions to produce a converted hydrocarbon.
2. The process of claim 1, wherein the first molecular sieve has a Si/Al molar ratio of less than about 5 and the second molecular sieve has a Si/Al molar ratio of greater than about 5.
3. The process of claim 2, wherein the first molecular sieve has a Si/Al molar ratio of less than about 2.
4. The process of claim 3, wherein the first molecular sieve is 13X molecular sieve.
5. The process of claim 2, wherein the second molecular sieve is selected from the group consisting of MCM-22, MCM-36, MCM-49, MCM-56, ITQ-1, ITQ-2, PSH-3, SSZ-25, zeolite beta, mordenite, zeolite omega, US-Y, ZSM-5, and combinations thereof, any of which may be a spent catalyst.
6. The process of claim 1, wherein the first molecular sieve is a 13X molecular sieve and the second molecular sieve has an X-ray diffraction pattern including the following d-spacing maxima 12.4 ± 0.25 , 6.9 ± 0.15 , 3.57 ± 0.07 and 3.42 ± 0.07 .
7. The process of claim 6, wherein the second molecular sieve is MCM-22.

8. The process of claim 1, wherein the hydrocarbon feedstock contains less than 200 ppmw of water prior to contacting with the first molecular sieve.
9. The process of claim 1, wherein the first molecular sieve has a Si/Al molar ratio of greater than about 5 and the second molecular sieve has a Si/Al molar ratio of between about 1 and 2.
10. The process of claim 9, wherein the first molecular sieve is MCM-22 and the second molecular sieve is 13X.
11. A process for converting a hydrocarbon feedstock using a catalyst, said process comprising:
 - (a) contacting the hydrocarbon feedstock with at least a first molecular sieve and then a second molecular sieve wherein the first and second molecular sieves have different pore diameters, to produce a treated hydrocarbon feedstock; and
 - (b) contacting the treated hydrocarbon feedstock with the catalyst under conversion conditions to produce a converted hydrocarbon.
12. The process of claim 11, wherein the first molecular sieve has a pore diameter of at least about 6 Angstroms and the second molecular sieve has a pore diameter of less than about 6 Angstroms.
13. The process of claim 11, wherein the first molecular sieve is selected from the group consisting of MCM-22, MCM-36, MCM-49, MCM-56, ITQ-1, ITQ-2, PSH-3, SSZ-25, zeolite beta, mordenite, zeolite omega, US-Y, and Linde type X molecular sieves, and combinations thereof, any of which may be a spent catalyst.
14. The process of claim 11, wherein the second molecular sieve is selected from the group consisting of Linde type A molecular sieves, medium pore zeolites, ZSM-5, and combinations thereof.
15. The process of claim 11, wherein the first molecular sieve is 13X molecular sieve and the second molecular sieve is 4A.

16. The process of claim 11, wherein the first molecular sieve has a pore diameter of less than about 6 Angstroms and the second molecular sieve has a pore diameter of at least about 6 Angstroms.

17. A process for alkylation of an aromatic hydrocarbon, said process comprising:

- (a) contacting the aromatic hydrocarbon with two different molecular sieve materials to produce a treated aromatic hydrocarbon; and
- (b) contacting the treated aromatic hydrocarbon with an alkylating agent in the presence of an alkylation catalyst and under alkylation conditions to produce an alkylated aromatic hydrocarbon.

18. The process of claim 17, wherein the two different molecular sieve materials are a first molecular sieve having a Si/Al molar ratio of less than about 5 and a second molecular sieve having a Si/Al molar ratio of greater than about 5.

19. The process of claim 18, wherein the aromatic hydrocarbon is benzene or toluene.

20. The process of claim 18, wherein the alkylating agent is ethylene or propylene.

21. The process of claim 18, wherein at least a portion of the first molecular sieve is 13X molecular sieve.

22. The process of claim 18, wherein the second molecular sieve is selected from the group consisting of MCM-22, MCM-36, MCM-49, MCM-56, ITQ-1, ITQ-2, PSH-3, SSZ-25, zeolite beta, mordenite, zeolite omega, US-Y, ZSM-5, and combinations thereof, any of which may be a spent catalyst.

23. The process of claim 18, wherein the aromatic hydrocarbon contains less than about 200 ppmw of water.

24. A process for alkylation of an aromatic hydrocarbon, said process comprising:

- (a) contacting the aromatic hydrocarbon with a first molecular sieve and then a second molecular sieve to produce a treated aromatic hydrocarbon;
 - (b) optionally contacting an alkylating agent with one or more molecular sieves to produce a treated alkylating agent; and
 - (c) contacting the treated aromatic hydrocarbon with an alkylating agent, or optionally the treated alkylating agent, in the presence of an alkylation catalyst and under alkylation conditions to produce an alkylated aromatic hydrocarbon.
25. The process of claim 24, wherein the first molecular sieve has a Si/Al molar ratio of less than about 5 and the second molecular sieve has a Si/Al molar ratio of greater than about 5.
26. The process of claim 25, wherein the first molecular sieve is a 13X molecular sieve, and the second molecular sieve is selected from the group consisting of MCM-22, MCM-36, MCM-49, MCM-56, ITQ-1, ITQ-2, PSH-3, SSZ-25, zeolite beta, mordenite, zeolite omega, US-Y, ZSM-5, and combinations thereof, any of which may be a spent catalyst.
27. The process of claim 24, wherein the first molecular sieve has a pore diameter of at least about 6 Angstroms and the second molecular sieve has a pore diameter of less than about 6 Angstroms.
28. The process of claim 27, wherein the first molecular sieve is selected from the group consisting of MCM-22, MCM-36, MCM-49, MCM-56, ITQ-1, ITQ-2, PSH-3, SSZ-25, zeolite beta, mordenite, zeolite omega, US-Y, Linde type X molecular sieves, and combinations thereof, any of which may be a spent catalyst.
29. The process of claim 27, wherein the second molecular sieve is selected from the group consisting of Linde type A molecular sieves, medium pore zeolites, ZSM-5, and combinations thereof.